

Screening of human papillomavirus (HPV) by pap smear

Rastreamento do papilomavírus humano (HPV) através do exame de papanicolaou

DOI: <http://dx.doi.org/10.31011/1519-339X.2018a18n85.08>

Lígia Souza Machado¹ • Mario Cezar Pires²

ABSTRACT

The aim of this study is to analyze women's knowledge regarding the Pap Smear as a preventive for Human Papillomavirus (HPV). This is a descriptive, quantitative study carried out in a health unit. Data were collected through a sample form of 49 women, with cytopathologic result of low level intraepithelial lesion; the collection took place between October and December 2015, and the results were analyzed by means of descriptive statistics. The infection prevalence occurred in young and single adult women with high school, family income less than five minimum wages. The preventive examination and its periodicity were mentioned by more than 70% of them. It is concluded that women's schooling showed a strong influence on the preventive examination, insufficient knowledge about the Pap Smear and its purpose, contributing to women becoming more vulnerable to Sexually Transmissible Infections (STIs), including HPV. Even though such an examination is so widely disseminated, it prevents the establishment of effective preventive action.

Keywords: Papillomaviridae; Women's Health; Diagnosis.

RESUMO

Objetiva-se analisar o conhecimento das mulheres em relação ao Exame de Papanicolaou como preventivo para o Papilomavírus Humano (HPV). Trata-se de um estudo descritivo, quantitativo, realizado em uma unidade de saúde. Os dados foram coletados através de formulário para amostra de 49 mulheres, com resultado citopatológico de lesão intraepitelial de baixo grau; a coleta ocorreu entre outubro e dezembro de 2015, e os resultados analisados por meio de estatística descritiva. A prevalência da infecção ocorreu em mulheres adultas jovens e solteiras com ensino médio, renda familiar inferior a cinco salários-mínimos. A realização do exame preventivo e sua periodicidade foram referidas por mais de 70% delas. Conclui-se que a escolaridade da mulher apontou uma forte influência sobre a realização do exame preventivo, o conhecimento insuficiente acerca do Exame Papanicolaou e da sua finalidade, contribuindo para as mulheres se tornarem mais vulneráveis às Infecções Sexualmente Transmissíveis (ISTs), incluindo o HPV. Mesmo sendo um exame tão amplamente divulgado, deste modo, impede o estabelecimento de ações eficazes no âmbito da prevenção.

Palavras-chave: Papillomaviridae; Saúde da Mulher; Diagnóstico.

NOTE

¹ Nurse and Master in Health Sciences. Professor at the Nursing Course at Anhanguera University - UniABC. E-mail: nsligia@hotmail.com. Corresponding author.

² Physician Dermatologist. Doctor and Master in Clinical Medicine. Full Professor of the Graduate Program in the Master's Degree and Doctorate in Health Sciences of the Institute of Medical Assistance to the State Public Servant of São Paulo and UNICID. E-mail: mariocezarpire@me.com.

INTRODUCTION

Among the major sexually transmitted pathogens, Human Papillomavirus (HPV) infection is the most prevalent in Brazil, approximately 685,800 new cases are estimated per year⁽⁴⁾. There are more than 200 types of HPV reported and classified into two categories according to the epidemiological risk and their potential for malignancy: low oncogenic risk (usually found in vulvo genital condyles) and high oncogenic risk - are related to malignant tumors⁽²⁾. It is estimated that approximately 75% to 80% of the female population will be infected up to 50 years-old⁽³⁾.

Every 10 people, one is infected with HPV and 500,000 cervical cancer new cases are detected every year, according to the World Health Organization (WHO), accounting for 230,000 deaths each year in the world. An estimated 16,340 new cases and 5,430 deaths per year were estimated in 2016, affecting the Brazilian female population⁽⁴⁾.

Cervical cancer is characterized by disordered replication of epithelial cells and has become an inconvenient public order issue in emerging countries due to high mortality rates. Among the risk factors, women with a low socioeconomic level stand out, so precautions are being taken to prevent cervical cancer, and it is worth highlighting the preventive examination (Pap Smear), the main strategy to detect precursor lesions and to diagnose the disease. In addition to be a simple and inexpensive examination, it has an important function to indicate the viral infections presence in the cervix, such as: genital warts and suspicion of HPV infection. Despite this, the coverage of the preventive exam is insufficient and the morbimortality has been increasing, showing an inefficacy of the governmental actions⁽⁵⁾.

The preventive examination should be a priority for all women who have already started sexual activity and can be performed at any Healthcare Center in the national territory. It is essential that the health services guide how it is done and the preventive examination importance, since its periodical realization allows to limit the mortality by the disease. According to the WHO, effective target population coverage of at least 80% ensures adequate diagnosis and treatment of the altered results, it is possible to reduce the incidence of invasive cervical cancer by an average of 60 to 90%⁽⁶⁻⁷⁾.

Some studies in underdeveloped countries point to numerous elements that compromise the women preventive practices, among the causes, some authors such as Sanjosé, Castellsagué, Clifford and collaborators, mention: the modesty, exposure of its body to a stranger, organizational and geographical barriers, financial difficulties, locomotion and/or obtaining care, non-consent of the partners, lack of professional-user interaction and adequate information about the test (used to determine the presence of abnormal cells or cellular changes in the cervix) and on HPV infection. The knowledge deprivation in relation to your body negatively influences the woman⁽⁸⁾.

Nevertheless, to minimize these obstacles related to the examination and to encourage greater participation of the female public for its implementation, there is the Viva Mulher Program created in 1997, aimed at attending women who had never taken the preventive exam or who were not doing it, more than three years. Important campaigns have intensified the cervical cancer suppression and contributed to a better coverage of the preventive examination in the national territory⁽⁹⁾.

Reducing cervical cancer mortality in Brazil is still a challenge to be overcome. Screening for this type of cancer represents a complex process in multiple stages: the call of the sexually active female population to collect the cervical-uterine smear, positive cases identification (suspected precursor lesion or cancer), examination result, treatment for diagnosed cases and evaluation. It is considered that women are still susceptible, since most of the infections caused by HPV regress spontaneously, passing unnoticed by women⁽¹⁰⁾.

In view of the need to promote awareness of the preventive examination and clarification about HPV infection, the following guiding question was elaborated: What is the perception of women about the Pap Smear and its benefits?

Thus, the present study aims to analyze women's knowledge regarding the Pap Smear or as a preventive for Human Papillomavirus, since the examination, besides detecting cervical cancer and its lesions, helps to diagnose innumerable vaginal infections, among them HPV. It is believed that identifying the women's knowledge on this theme will contribute to the development of assistance and educational strategies, as well as the interest of other researchers in the subject.

METHOD

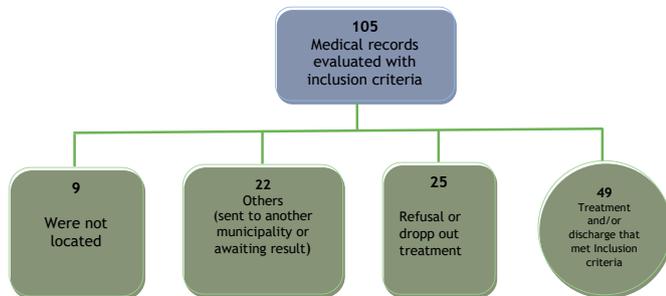
It is a descriptive and transversal study with a quantitative approach. The research was carried out in a Healthcare Center in Ribeirão Pires, integrating a group of municipalities known as the Big ABC Region, in the state of São Paulo.

It also works as a reference for all cervical cancer examinations and uses the Cervical Cancer Information System (SISCOLO), which allowed the identification of 105 women who met the inclusion criteria, such as: positive result from smear oncology cytology with low level of intraepithelial lesion (comprising HPV cytopathic effect and/or cervical intraepithelial neoplasia grade I - NIC I), showing signs or symptoms suggestive of genital HPV and carried out the preventive examination in the municipality. Excluded from this study were the results of exams comprising absence of atypical and/or abnormal cells with immunodeficiencies (including Human Immunodeficiency Virus (HIV) infection and inconclusive medical diagnosis).

However, of the 105 women contacted: nine were not located through telephone contact (three attempts); 22 were

excluded because they were awaiting examination results and/or were referred for treatment in another municipality; 25 refused and/or dropped outpatient treatment and 49 were included in the study and answered the forms, the study was conducted between October and December 2015.

Figure 1. Flowchart defining the study population. Ribeirão Pires, SP, Brazil, 2015.



Source: survey data

The data collection consisted of three steps: first location of the residential address through SISCOLO and obtaining the prevention exams results through the log books filed in the main Healthcare Center; 2nd medical records check for the patients' demographic of the risk factors. In this medical records review, were obtained information regarding: identification, age, location and confirmation of positive HPV cytopathological exams. In the 3rd, use of a structured form to execute the research.

After data collection, the data were organized into a public domain software program created by the Centers for Disease Control and Prevention (CDC) in the United States of America for the global public health community of professionals and researchers (EPI INFO® version 7.1.4), and transported to Microsoft Office Excel® (2016) program spreadsheets. These analyzed using descriptive statistics, organizing the numerical data into absolute and percentage frequency distribution tables.

It should be emphasized that the study was submitted to the Research Ethics Committee of the Institute of Medical Assistance to the State Public Service of São Paulo (IAMSPE-SP), as recommended by Resolution No. 466/12 of the National Health Council, under process No. 348.886 and was approved on August 5, 2013. All the obtained data were treated in a confidential way, guaranteeing the participants anonymity, who, before answering the forms, were clarified as to the confidentiality and scientific nature of the research, signing the Free and Informed Consent Term (FICT).

RESULTS

Participating in this study were 49 women with an examination result comprising low-level of intraepithelial lesion, the average age of the group was 31 to 61 years, corresponding to (65.30%). Among them, 26 (53.06%) had a considerable number of single women and a higher

prevalence of this infection among women enrolled in high school 20 (40.82%), and a women's population constituted by the most varied professions and low income 42 (85.72%) (Table 1).

Table 2 shows some risk factors for genital HPV, 25 (51.02%) reported having one or more children; 30

Table 1. Prevalence of Human Papillomavirus (HPV) genital infection in women according to socioeconomic-demographic variables. Ribeirão Pires, SP, 2015.

Variables	N	%
Age Group		
15 -20 years	8	16,33
21 - 30 years	16	32,65
31 - 40 years	16	32,65
41 - 50 years	6	12,24
> 51 years	3	6,12
Marital Status		
Married	12	24,49
Divorced	8	16,33
Single	26	53,06
Widow	3	6,12
Education		
Non-literate	1	2,04
Elementary School	13	26,53
High School	20	40,82
Higher Education	15	30,61
Family Income (MW)*		
< 1 MW	5	10,20
1 - 2 MW	22	44,90
3 - 4 MW	15	30,61
> 5 MW	7	14,29

Note: * SM - Minimum Wage (considered the Brazilian minimum wage in effect in the year of 2015, \$ 788.00 reais).

Source: survey data.

(61.22%) used some type of contraceptive method; 44 (89.80%) started sexual life after 15 years and two thirds of the women, 34 (69.39%), stated that they are not in the habit of using condoms during sexual intercourse.

The information concerning the gynecological and obstetrical data can be observed in Table 3. Most of the interviewees, 41 (83.67%) undergo the preventive examination and 37 (75.51%) of the women perform regularly. However, 2 (4.08%) stated that they had never performed the examination and only sought the health center because of clinical manifestations suggestive of STI.

The data in Table 4 show the information about genital HPV, approximately half of the participants said they knew it - 27 (55.10%), however, 8 (16.33%) were said to have never heard talk about HPV. Regarding the virus transmission, 44 (89.80%) of the women were aware of the disease transmission, reporting that it was a sexually transmitted disease/virus and a possible cause of cervical cancer, and that the virus would exclusively affect the female sex.

Table 2. Prevalence of Human Papillomavirus (HPV) genital infection in women according to risk factor variables. Ribeirão Pires, SP, 2015.

Variables	N	%
Children		
No	24	48,98
Yes (1-3 children)	19	51,02
Use of Oral Contraceptive Method		
No	19	38,78
Yes	30	61,22
Beginning of Sexual Activity		
<15 years	5	10,20
>15 years	44	89,80
Use a Condom		
No	34	69,39
Yes	15	30,61

Source: survey data.

Table 3. Prevalence of genital Human Papillomavirus (HPV) infection in women according to gynecological-obstetric data variables. Ribeirão Pires, SP, 2015.

Variables	N	%
Preventive Examination		
Yes	41	83,67
No	8	16,33
Pap Smear Periodicity		
I never did	2	4,08
1 year	37	75,51
2 years	10	20,41
3 years	0	0

Source: survey data.

DISCUSSION

Through the material collected in the Pap Smear, it is possible to analyze vagina cells to detect inflammations, dysplasias and vaginal infections like HPV and cervical cancer⁽¹⁰⁾.

The increase in life expectancy, urbanization and globalization are some of the factors that may explain the cervical cancer occurrence, and this is mostly associated with HPV infection⁽¹¹⁾, has been spreading considerably throughout the national territory.

The age group with the highest number of cellular changes was between 21 and 40 years (65.30%), an infection that significantly affects sexually active and reproductive age women. Compared with the literature, a study⁽¹²⁾ conducted in the Northern region of Brazil, in Pará, was found a similar scenario, the majority of women aged between 21 and 40 years. In contrast, a study⁽¹¹⁾ conducted in the Southern region, in Uruguiana, did not confirm this connection. It is believed that the differences between the studies are due to characteristics of the respective populations, with their own cultural aspects and different sexual habits.

Table 4. Prevalence of Human Papillomavirus (HPV) genital infection in relation to the level of knowledge about HPV. Ribeirão Pires, SP, 2015.

Variables	N	%
Know HPV		
I've never heard of	8	16,33
I've heard	14	28,57
I know	27	55,10
How is contracted		
Cutlery sharing	0	0
Sexual way	49	100
Frequency of the same space (with infected person)	0	0
Skin contact	4	8,16
Other	0	0
No opinion	1	2,04
HPV Infection Affects		
Only men	0	0
Only women	24	48,98
Men and women	18	36,73
No opinion	7	14,29
HPV has symptoms		
Always symptomatic	7	14,29
Sometimes symptomatic	24	48,98
Never symptomatic	6	12,24
No opinion	12	24,49
HPV Prevention		
Other methods	0	0
Preservative	49	100

Source: survey data.

In this study, there were expressive numbers of single uninfected women. Given the episode suggests that single women would be more vulnerable to the infectious diseases transmitted by the sexual act, since the way the woman lives her sexuality is related to their ways of living which, in turn, concerns the social context in which it inserts. In the United States of America⁽¹⁴⁾, obtained a compatible result, however, in a research carried out in São Paulo⁽¹⁵⁾ and Bangladesh⁽¹⁶⁾ a higher rate of married women was identified. Married women are assumed to trust their partners' loyalty, using no barrier method (condom), and have the mistaken idea that they are protected from STIs.

However, a higher prevalence in women with median education, similar facts were found by other authors⁽⁹⁾. From this perspective, the same authors pointed out an increased risk for HPV infections in women with lower educational level. It is considered that these inequalities in relation to the educational level are directed to the conditions of the research sites and cannot be compared with the HPV presence.

Regarding to family income, the wages diversity is a Brazilian population peculiarity. Corroborating with other researches⁽¹⁷⁻¹⁸⁻¹⁹⁾, concluded that the majority were women

with low pay, especially between one and two minimum wages. These data confer with our study, demonstrating a low socioeconomic level, despite the educational level of these women. Were found out that the high number of women with low income, in general, uses the Healthcare Center.

As for parity, it was observed that slightly more than half of the women had one or more children, and there was no significant difference with nulliparous women. Although not statistically expressive, there is slight increase of HPV infection in women with one, two and three children. Some literature related multiparity with infection risk by genital HPV and, consequently, of cervical cancer⁽⁹⁾. Similar data was found in Nova Iguaçu⁽²⁰⁾, it was noted that the majority of interviewees had one or more children. The result's justification would be the fact that with multiple pregnancies the transitional epithelium of the ectocervix is maintained for many years, becoming more exposed to the virus.

The use of oral contraceptives for a long time would be a risk factor for cervical cancer in women who have used these drugs for more than 10 years⁽²¹⁾. In this study, a substantial proportion of the interviewees admitted using oral contraceptives. However, another study⁽²²⁾ observed the opposite: women on continuous contraceptive use had lower risk of cervical cancer. Thus, in the studied population, there was no statistical difference regarding the HPV prevalence among users of oral contraceptives and non-users. Perhaps, with a larger casuistry we could establish what would be the reality of this association in our midst.

The primary risk factors for HPV acquisition are generally associated with early sexual activity, due to the longer exposure time⁽²¹⁾. In this sample, however, there is a higher prevalence in women who delay sexual life after 15 years-old, diverging from the findings of another study⁽¹⁷⁾. Once more, it is assumed that these differences must be due to the local population characteristics.

Condom is a barrier contraceptive and one of the major symbols of safe sex, recommended for use throughout sexual intercourse, with or without penetration, however, does not fully protect against HPV infection, as contagion can occur through contact with vulva skin, perineal region, perianal and scrotal sac⁽²³⁾. A large number of women who did not use condoms on a regular basis suggested that women normally use condoms during their first sexual intercourse and end up dispensing this protection when the relationship becomes more stable. As a result, they are more exposed to HPV virus and other vaginal infections.

The present study showed high compliance to the oncotoc cytology collection among the participants and, on the examination periodicity, they affirmed to do it annually.

This fact confronts with research carried out in Niterói⁽²⁴⁾ and Jamaica⁽²⁵⁾, in which women likewise complied to the preventive examination. One of the barriers to

noncompliance with the oncotoc cytology examination is the menstrual cycle that can coincide with the collection schedule, making the procedure impossible. The question was raised to identify the women's compliance about the collection and it was not possible to relate as a risk factor for the HPV infection, presenting only influence in the examination schedule. The Pap Smear, in addition, its importance for women's health, allows early detection and treatment in a timely manner, being one of the most important strategies in coping with this condition.

The question about the HPV infection knowledge and its transmission allowed comparing this information with study⁽⁵⁾ held in Uberaba, which also shares the similar result to ours. Most women revealed that they had knowledge about the infection and its transmission types, saying it was a virus-caused and a sexually transmitted disease that could lead to cervical cancer. On the other hand, a substantial proportion interviewed women believed that HPV infection did not affect men, although they did respond that they knew about genital HPV. These statements lead to the identification of the disinformation that exists between knowledge and transmitted information, which leads to failures in the educational process of Sexually Transmitted Diseases (STDs) prevention, because, although they knew about the virus, it was observed that a sizable portion did not use condoms to protect against infection.

In reviewing participants' responses to HPV prevention, they were unanimous in stating that condom use in intercourse is the best precautionary method, even so, many do not use it to protect themselves. Study conducted in Uberaba⁽⁵⁾ showed that women recognized the condoms use as the best prevention strategy for HPV. One assumption for not using condoms would be too much trust in the partner. Although the condom does not prevent full against HPV infection, it is the most indicated method. Women recognize the condoms use as the best method to prevent HPV infection, however, they find condoms an uncomfortable element that hinders their sexual intimacy. Were realize, therefore, that there are still women who have misleading or limited information about this virus.

These investigations about the HPV infection prevalence in the female population are important to map the true situation of our country, and recent studies in other Brazilian territories will be important to identify in which regions is most urgent the strategies promotion for the HPV infection prevention.

CONCLUSION

Through the results of this study, it was possible to identify that women relate and seek, through the examination, only gynecological injuries and this is due to the lack of information and, consequently, the lack of knowledge about this subject.

It should be emphasized that it is not enough to guarantee access to the cytopathological examination

in the health units. Firstly, it is necessary for the woman to have access to information about the exam, its benefits and benefits for women's health, with a view to improving adherence to comply with the Ministry of Health recommendations.

In this way, it is believed that women resistant to screening will be led to reflect on their understandings and will become aware of the true examination importance, so that they can effectively carry it out.

It is therefore considered necessary to adopt strategies among health professionals, including nurses, to implement educational spaces with women, a way of facilitating women's compliance to the examination, allowing a differentiated performance, respecting it in their individuality, privacy and the right to know about the disease and the factors that involve it, and especially about its health.

It is believed that this measure would result in a positive impact on the population's health, since the infection by this virus works as a cervical cancer precursor and would leave them less exposed to STIs.

It is also recommended to carry out new studies that contemplate this theme in different scenarios and extending the male population. Adequate understanding of the genital HPV infection epidemiology, as well as strategies for better knowledge of it, may contribute to the development of more specific research protocols for the entire population.

REFERENCES

1. Souza GDS, Oliveira RAA, Stevanin A, Sousa MF, Almeida ECA. Conception of the women of Mirandópolis - São Paulo about the Pap Smear. *Rev Enferm UFSM*. 2012; 3(3):470-9.
2. Perez M, Gil AO, Wroclawsk IER, Guidi HG, Schiavin IJL, Carvalho JJ. HPV in man. In: Carvalho JJM, Oyakawa N. I Brazilian Consensus on HPV. 1.ed. São Paulo: BG Cultural; 2000. p. 7-16.
3. Entiauspe LG, Silveira M, Nunes EMN, Basgalupp SP, Stauffert D, Dellagostin OA, et al. High incidence of oncogenic HPV genotypes found in women from Southern Brazil. *Braz J Microbiol*. 2014; 45(2):689-694.
4. Pimenta ATM, Melli PPS, Duarte G, Quintana SM. Women knowledge on some aspects of human papillomavirus. *Medicina (Ribeirão Preto)*. 2014; 47(2):143-8.
5. Silveira CF, Melo MM, Rodrigues LR, Parreira BDM. Knowledge of women aged 40 to 60 years on human papillomavirus. *Rev RENE*. 2011; 12(2):309-15.
6. Almeida ACG, Sakama ATA, Campos RG. Correlation of cervical cancer with human papillomavirus. *Revista APS*. 2006; 9(2):128-35.
7. Longatto-Filho A, Hammes LS, Sarian LO, Roteli-Martins C, Derchain SF, Erzen M, et al. Hormonal contraceptives and the length of their use are not independent risk factors for high-risk HPV infections or high-grade CIN. *Gynecol Obstet Invest*. 2011; 71(2):93-103.
8. Sanjosé S, Diaz M, Castellsagué X, Clifford G, Bruni L, Muñoz N, Bosch FX. Worldwide prevalence and genotype distribution of cervical human papillomavirus DNA in women with normal cytology: a meta-analysis. *Lancet Infect Dis*. New York. 2007; 7(7):453-459.
9. Rocha BD, Bisognin P, Cortes LF, Spall KB, Landerdahl MC, Vogt MSL. Pap Smear exam: knowledge of users of a healthcare center. *Rev Enferm UFSM*. 2012; 2(3):619-629.
10. Fedrizzi EN, Schlup CG, Menezes ME, Ocampos M. Human papillomavirus (HPV) infection in women from Florianópolis, Santa Catarina. *DST J Bras Doenças Sex Transm*. 2008; 20(2):73-79.
11. Baloch Z, Yue L, Yuan T, Feng Y, Wenlin Tai W, Liu Y, et al. Status of Human Papillomavirus Infection in the Ethnic Population in Yunnan Province, China. *Biomed Res Int*. 2015; (2015):314815.
12. Duarte DV, Brito EB, Canto AS, Ishikawa EAY, Pinheiro JG, Costa JHG, et al. Frequency and genotyping of human papillomavirus in women from riverside communities in the city of Abaetetuba, Pará, Brazil. *Rev Pan-Amaz Saude*. 2010; 1(3):75-82.
13. Ströher DJ, Aramburu TDB, Abad MAS, Nunes VT, Manfredini V. Perfil Cytopathology of women attended at the healthcare centers of the city of Uruguaiana, RS. *DST J bras Doenças Sex Transm*. 2012; 24(3):167-170.
14. Shi R, Devarakonda S, Liu L, Taylor H, Mills G. Factors associated with genital human papillomavirus infection among adult females in the United States, NHANES 2007–2010. *BMC Res Notes*. 2014; 7 (1):544.
15. Gaspar J, Quintana SM, Reis RK, Gir E. Sociodemographic and clinical factors of women with human papillomavirus and its association with HIV virus. *Rev Latino-Am Enferm*. 2015; 23(1):74-78.
16. Nahar Q, Sultana F, Alam A, Islam JY, Rahman M, Khatun F, et al. Genital human papillomavirus infection among women in Bangladesh: findings from a population-based survey. *PLoS ONE*. 2014; 9(11).
17. Carvalho MCMP, Queiroz ABA. Women with precursor lesions of cervical cancer and HPV: a description of the socioeconomic and demographic profile. *DST J bras Doenças Sex Transm*. 2011; 23(1):28-33.
18. Soares MC, Mishima SM, Meincke SMK, Simino GPR. Cervical cancer: characterization of women in a municipality in southern Brazil. *Rev Esc Enferm Anna Nery*. 2010; 14(1):90-96.
19. Yassoyama MCBM, Salomão MLM, Vicentini ME. Characteristics of women undergoing cervical screening during pregnancy: bases for strategies of the family health program (FHP). *Arq Cienc Saúde*. 2005; 12(4):172-76.
20. Girianelli VR, Thuler LCS, Silva GA. HPV prevalence in women assisted by family health strategy in the state of Rio de Janeiro. *Rev Bras Ginecol Obstet*. 2010; 32(1):39-46.
21. Castellsagué X, Muñoz N. Cofactors in Human papillomavirus carcinogenesis: role of parity, oral contraceptives, and tobacco smoking. *J Natl Cancer Inst Monogr*. 2003; (31):20-28.
22. Shields TS, Brinton LA, Burk RD, Wang SS, Weinstein SJ, Regina G, et al. A case-control study of risk factors for invasive cervical cancer among U.S. women exposed to oncogenic types of human papillomavirus. *Cancer Epidemiol Biomarkers Prev*. 2004; 13(10):1574-1582.
23. Lam JU, Rebolj M, Dugué PA, Bonde J, Von Euler-Chelpin M, Lynge E. Condom use in prevention of human papillomavirus

- infections and cervical neoplasia: systematic review of longitudinal studies. *J Med Screen*. 2014; 21(1):38–50.
24. Augusto EF, Santos LSS, Oliveira LHS. Detection of human papillomavirus in cervical cytologies of women treated in the family health program. *Rev Latino-Am Enferm*. 2014; 22(1):100-7.
25. Lewis-Bell K, Luciani S, Unger ER, Hariri S, McFarlane S, Steinau M, et al. Genital human papillomaviruses among women of reproductive age in Jamaica. *Rev Panam Salud Publica*. 2013; 33(3):159–65.